IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISON

THE MAGNAVOX COMPANY, a corporation,)
and SANDERS ASSOCIATES, INC., a)
corporation,)
)
　　　　　　　　　　Plaintiffs,)
)
)
　　　　　vs)　　80 C 4124
MATTEL, INC., a corporation,)
SEARS, ROEBUCK & COMPANY,)
a corporation,)
)
　　　　　　　　　　Defendants.)

DOCKETED

AUG 19 1982

Before The HONORABLE GEORGE N. LEIGHTON, Judge

Thursday, July 8, 1982

10:00 a.m.

FILED

AUG 1 0 1982

STUART CUNNINGHAM, C.
D STATES DISTRICT CO

The trial was resumed pursant to adjournment.

Present:

　　MR. THEODORE ANDERSON
　　MR. JAMES T. WILLIAMS

　　MR. GRANGER COOK, JR.,
　　MR. EDWARD D. MANZO

158

1 THE COURT: Good morning.

2 MR. ANDERSON: Good morning, your Honor.

3 MR. COOK: Good morning, your Honor.

4 THE COURT: Dr. Chandler, resume the witness chair.

5 DAVID P. CHANDLER,

6 called as a witness by the defendants, having been previously

7 duly sworn, was examined and testified further as follows:

8 CROSS EXAMINATION (continued)

9 BY MR. ANDERSON:

10 Q   Dr. Chandler, yesterday we covered the results

11 of the play of the Mattel master component and the six

12 cartridges that are accused, and I'd like to now direct

13 attention to how the game operates to produce the results

14 in the form of a picture on the television screen.

15 I think you testified that it is convenient

16 to use the same clock source for various signals in the

17 Mattel game, is that right?

18 A   That's correct.

19 Q   And that clock is basically the color signal

20 at 3.58 megahertz or megacycles per second, is that right?

21 A   It actually starts out as double that frequency

22 in the system and gets counted a couple of times before it

23 gets to be the CPU clock.

24 Q   But the highest frequency that's used in the

25 system for any operations, is that 3.58 megahertz?

1   A   No, it is double that. The color chip uses the

2 double frequency.

3   Q   And with respect to the rest of the game,

4 other than the color chip, it uses nothing more than 3.58

5 times the color burst frequency?

6   A   That's right.

Q   And the color chip is the last chip that we talked about yesterday before you -- after the output of the television signals from the STIC and before the color chip applies those signals to the RF modulator to put the picture on the screen.

A   That's correct, yes.

Q   Now, that same clock provides a STIC clock signal at 60 hertz or 60 cycles per second, is that right?

A   That is the source of signal that gets counted down to produce a signal that is at approximately 60 cycles per second, yes.

Q   Does it shift around or is it a particular frequency?

A   It is a fixed number. It is not exactly 60 cycles a second. It is very close.

Q   Do you know what it is?

A   Not exactly.

Q   But it is very close?

A   Very close, yes.

Q   Less than a cycle away from that or two?

A   Yes.

Q   And that STIC chip signal is used to clock the various operations in the STIC chip, is that the way that functions?

A   The 60 cycle signal is not used predominantly inside the STIC chip. The 3.587 -- 3.579 megahertz signal clock is used extensively inside the STIC chip.

1   Q   What use is made of the 60 hertz STIC clock signal?

2   A   It is used to create the vertical sync pulse.

3   That's really why it's created, to create the vertical sync

4   pulse, and it also, since the communication with the STIC

5   chip has to be done during vertical retrace, it is the source

6   then of the interrupt signal for the rest of the system.

7   Q   And that interrupt signal is called SR-1?

8   A   That's correct.

         Q   It's provided by the system from the television
set?

         A   That's correct.

         Q   To produce that picture?

         A   Right.

         Q   And the vertical synchronization signal for the
television screen, which is in the composite video in the
Mattel game, is always locked in phase with the STIC chip
clock signal and with SR-1, the interrupt signal for the
STIC CPU timing equation, is that correct?

         A   Yes. It is in phase with the SR-1 clock signal.
It is derived from the color burst frequency so in the
sense that it is synchronized to that signal, yes.

         Q   They are both synchronized to the same
frequency, you say?

         A   Yes, and that was...

1   Q   So that signal is the source of SR-1 and that

2 signal is also the source of the vertical synchronization

3 signals for generating the composite television video

4 signal and for creating a display on the television screen,

5 is that right?

6   A   The first two, yes. The second two, it is not

7 used in the system for creating that picture on the screen,

8 no.

9   Q   It's provided by the system into the television

10 set?

11   A   That's correct.

12   Q   To produce that picture?

13   A   Right.

14   Q   And the vertical synchronization signal for the

15 television screen, which is in the composite video in the

16 Mattel game, is always locked in phase with the STIC chip

17 clock signal and with SR-1, the interrupt signal for the

18 STIC CPU timing operation, is that correct?

19   A   Yes. It is in phase with the SR-1 clock signal.

20 It is derived from the color burst frequency and in the

21 sense that it is synchronized to that signal, yes.

22   Q   They are both synchronized to the color burst

23 frequency, you say?

24   A   Yes, and that wording tends to imply that there

25 is content in the color burst signal that knows when that's

happening and when it is not, but it comes from that and

is counted down from that and therefore, of course, is

synchronized to the edge of that. There is no significance

to that as far as use of that system is concerned

but it is a true statement.

Q   If I want to know the significance, Dr. Chandler,

I'll ask you.

A   All right.

Q   That's accomplished by counting down, you say,

by using dividers to get down to the 60 cycle SR-1 signal,

STIC chip signal and the vertical sync signal?

A   That's correct.

Q   And from that same signal there are two micro-

processor clock signals, Phi-1 and Phi-2, is that correct?

A   Yes, it is a two-phase clock signal, yes.

Q   And that's at 1.79 megahertz?

A   Approximately.

Q   Or megacycles per second approximately?

A   Yes.

Q   One-half of the color burst signal that is used

in the color television set?

A   That's correct.

Q   Now, also from that same source the Mattel game

generates a horizontal synchronization signal, doesn't it,

by dividing down and selecting pulses at about 15,720 cycles
per second or hertz?

A   Yes, for the horizontal sync, yes.

1   Q   And somehow from that same set of signals there

2   is a horizontal blanking signal and a vertical blanking

3   signal generated   in the composite video?

4   A   That's correct, yes.

5   Q   And they are all synchronized together, all

6   divided down from the same signal and, therefore, always

7   are in lock step?

8   A   That's correct.

9   Q   Now, if you just disconnected any one of those,

10   the system cut any one of those out, the system would not

11   function without doing something else; isn't that true?

12   A   Well, certainly if you take a signal away and

13   don'treplace it with something that can perform the function,

   it would quit working, that's correct.

    Q   And if you used any different clock signal, for

   example, for the CPU clock, that would cause you some

   worry, would it not?

    A   Well, not if I had -- not if I were using that.

    Q   Without doing anything else.

    A   Well, not if I were using that same clock signal

   for the rest of the things it depended on relating to the CPU;

   that would work fine.

        If you just take the CPU by itself and put

   it on different clock signals, it isn't going to work.

   But nobody would do that.

1   Q   So you have to somehow use that in interrelationship

2   with other components other than the CPU, including the STIC

3   chip; isn't that right?

4   A   As far as the portion of the STIC chip which is

5   communicating with the CPU, would have to be; as far as the

6   rest of the functions are concerned, it would not have to be.

7   Q   So when you said it is convenient to use the same

8   signal for vertical sync and horizontal sync and all of the

9   other signals in the TV receiver, or output, and in the,

10   as you say, in the composite video signal that goes to the

11   TV set, and in the various components, it would take a

12   redesign of the receiver to do it any other way, and it would

13   be less convenient according to your testimony the other day,

     isn't that correct?

              MR. COOK: Objection, your Honor. I am not sure

         the question is clear. I think it should be -- it was

         restated several times in the middle of the question.

              MR. ANDERSON: If the witness understands it --

              THE COURT: Do you understand the question?

              THE WITNESS: I am not sure I do.

              THE COURT: Why don't you rephrase the question?

              MR. ANDERSON: Sure.

1   BY MR. ANDERSON:

2   Q   Isn't it a fact, Dr. Chandler, that if, as you --

3   I will start over.

4   Isn't it a fact, Dr. Chandler, that to use

5   a different signal, not based upon the same colorburst source

6   of signals to operate the CPU, would require you to also

7   change certain other clocks to other components, including

8   the STIC chip; and it would be inconvenient and require a

9   redesign of the game?

10   A   If you are starting from a completed design as

11   we now have and wanted to make that change, yes, it would

12   require redesign.

13   If you are starting out with that intent to

14   begin with then the magnitude of the design difference would

15   be very insignificant.

16   It is more convenient to use it, and since it

17   is there and no reason not to use it, we did. But that's

18   about the extent to the significance of that interdependence.

19   Q   In fact, all of the operations of the game, and

20   the TV set, are correlated together through that basic signal

21   that includes vertical and horizontal sync, isn't that

22   correct?

23   A   I think that's too broad a statement. Certainly

24   the relationship to the TV set is all tied to that, and

25   that's why those signals were picked and why they were there,

1 because we have to tie it to a TV set.

2   But the functions going on within the computer

3 end of the thing are, at best, very vaguely related to that

4 set of signals.

5   Q   Now, the CPU and the STIC, for example, are

6 trying to communicate with the same devices as you suggested

7 in your direct testimony, isn't that correct?

8   A   The communication link between the two, of course,

9 is necessary. And that has to be synchronized in some fashion.

10 There are a number of ways of doing that. And we elected to

11 use the one which we did. But there are a number of others

12 that could have, and it would not change significantly the

13 nature of what's going on.

14   Q   Now, doesn't the interrupt signal, SR-1, that's

15 called, what, Service Request 1?

16   A   Probably, I'm not sure.

17   Q   Is that what the SR stands for.

18   A   Probably.

19   Q   The STIC chip issues that Service Request SR-1

20 to interrupt the CPU and cause the CPU to update the data

21 in the STIC chip, is that right?

22   A   Well, it's -- to say that it causes the STIC --

23 the computer to update the data is an incorrect statement,

24 I think. It is, it is a signal to the CPU to tell it that

25 it now has access to the STIC chip and the rest of the circuitry

1   in the STIC bus to do whatever it wants to. And that's

2   the only time period in which it is allowed to go in and

3   talk to the CPU -- to the STIC system. But that's the

4   extent to which that --

5   Q   And I think you testified normally and in most

6   of the games that we are talking about that does happen?

7   A   Yes.

8   Q   CPU does update the STIC chip data during the

9   vertical retrace time of the television set, as indicated

10 by vertical sync, in response to the service request of

11 the CPU in the normal course of the operation of the game?

12   A   Yes, that's the normal time in which the CPU

13 communicates with the STIC system and that supplies it

14 new information, new instructions.

15   Q   Now, as the game is now built if it didn't use

16 SR-1 synchronized with vertical sync so that the CPU might

17 try to update the data while the STIC chip were also causing

18 a display on the television screen in some random matter, that

19 would create problems, wouldn't it?

20   THE WITNESS: Say that one again.

21   MR. ANDERSON: Would you read it back?

22   THE COURT: Please read the question back.

23   (Question read.)

24 BY THE WITNESS:

25   A   Well, I think you take any one design, including

1   this one, and eliminate any future of it, it is not going to

2   work.

3   But to say that's crucial and that we could

4   not have done it some other way with the same effect is

5   wrong implication.

6   BY MR. ANDERSON:

7   Q   So in your design, it becomes critical that the

8   Service Request from the STIC chip be synchronized with

9   vertical sync in order to update the STIC chip during the

10 vertical retrace time?

11   A   Well, no more so than it is critical to have any

12 other connection made in the system.

13   Q   All right. Now, during your direct examination,

14 you described the signal used to interrupt the program, and

15 at Page 798, you said the STIC chip outputs a two-faced clock

16 which is used as a clock signal for the CPU. And at that

17 point you indicated that this was a convenient way to do

18 it. And is it correct to do it any other way would

19 create a problem?

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1   MR. COOK: Your Honor, perhaps it might be fair

2   to the witness to let him see the testimony to which

3   counsel is referring.

4   MR. ANDERSON: All right, I have no objection to

5   that.

6   THE COURT: All right.

7   MR. ANDERSON: Actually, the quote is at the top

8   of page 799.

9   I'll just strike that question, now that

10   you have it in front of you.

11   BY MR. ANDERSON:

12   Q   I will just ask you if it isn't a fact that the

13   clock signals that are used to clock the CPU, the 1.79

14   megahertz signal, is in fact related to what is happening

15   in terms of display in view of the signal being synchronized

16   with horizontal, vertical sync and all the other signals

17   that I have mentioned?

18   A   No, I guess I would have to say I don't see that

19   it is related to the display in terms of creating the

20   information as to where objects should be or what they

21   should be or any of that sort of thing. The CPU does not

22   use that information in any way in its computations as to

23   deciding what to do.

24   Q   The CPU must perform its operations in the normal

25   case, at least, within the vertical retrace time of the

1 television receiver; isn't that correct?

2   A   Well, the only function that must perform at

3 that stage of the game is its communication with the STIC

4 system, just to be able to supply information to the STIC

5 chip and read out any information from it that it wants to.

6 It is strictly communication timing relationship and has

7 nothing to do directly with the computations of game play

8 or position of objects or anything relating to the display

9 itself.

10   Q   With respect to the complete video signal that

11 is generated in the Mattel game, isn't it a fact that that

12 complete video signal for displaying the hit and hitting

13 symbols and the background of the game could be indistin-

14 guishable whether the mechanism employed was a micro-

15 processor or a hand-wired LSI or even discrete transistors?

16   MR. COOK: Objection, your Honor, the use of

17   the term "hitting and hit symbols;" there is no ante-

18   cedent for it. Since there seems to be some dis-

19   cussion and confusion on the part of Magnavox as to

20   what the hit and hitting symbols are in the game,

21   it seems to me the question should be more specifically

22   directed to a specific game.

23   THE COURT: No, the objection is overruled.

24   Let Mr. Anderson put his question. If there is some

25   inability of Dr. Chandler to answer, he can say so.

The objection is overruled.

MR. ANDERSON: Thank you, your Honor.

THE WITNESS: I would like to hear the question again.

THE COURT: Read the question to the witness.

(Question read)

MR. ANDERSON: I'll strike that, your Honor, and restate it. I misspoke slightly.

BY MR. ANDERSON:

    Q   Dr. Chandler, couldn't the complete video signal for displaying the hit and hitting symbols and the background of a game such as a Mattel game be indistinguishable whether the particular mechanism employed was a microprocessor or a large scale integrated circuit or even discrete transistors and other components wired together.

    MR. COOK: I have to object, your Honor.

    I frankly don't understand the question, but I

    defer to the witness.

BY THE WITNESS:

    A   Well, there is a lot implied in that question. Whether you could in fact produce game play characteristics of the nature that we are producing with hardwired circuitry is questionable, I think. Certainly, if you did that and if you were successful in getting that kind of game play developed and this sort of thing and produced a signal which a television set would accept, that's -- I mean, by the time you get to the output to the television set the requirement is that it be a signal that the television system can accept and it has to be a format that's common.

    So to the extent that you can produce that kind of game play capabilities otherwise then the output, the signal would be the same. It has to be in order to

1   interface the TV set.

2   THE COURT: All right.

3   MR. ANDERSON: Thank you.

4   BY MR. ANDERSON:

5   Q   Now, with respect to the difficulty of accomplish-

6   ing the game play characteristics, is that because it might

7   take thousands of transistors to do it or several LSIs?

8   A   That's one of the aspects that would be involved.

9   I guess the other aspect is the ability to change to

10   different games easily and things of that sort, which is

11   certainly an important feature of the system.

12   Q   Yesterday you testified a bit about changing

13   the speed of the Mattel game by throwing a switch, I

14   believe.

15   A   By pushing -- by which button it is you push in

16   the hand controller to bring up the game.

17   Q   When the player presses that button, will you

18   please describe how the system then operates to change

19   the speed of the game?

20   A   In the program there's in the executive ROM ,in

21   the system, there is a sequence of instructions that go

22   and examine that key pad that brings the thing up and based

23   on which key it is, it sets some -- sets a number in a

24   register which is used as a basic counting, time counting

25   register that controls the speed of the operation of the

1   system, of the game play computations.

2   Q   Can you describe in more detail how that button

3   functions and what it does in the game to change the speed

4   of the game?

5   A   Well, the button itself is -- it is one of the

6   various inputs that the hand controller is capable of

7   inputting into the system. The microprocessor is capable

8   of reading that code and knowing which button it is and

9   based on what that answer is that comes back, the program

10   goes and sets a value in a register that is used as part

11   of the timing circuitry, the timing program for game

12   play operation.

Q   I'm only interested in the speed change and what
code or what particular routine or whatever it is is used.
Do you know what that is?

A   I'm not sure what the name of the register is that
is used. We would have to look through the executive
program to find that, and I'm not sure that the name of that
register is important. There is a register in there that
is a number which is used in counting down the clock signals
to arrive at timing, counting out time outs of any of the
functions that are time dependent, simply change that number,
it changes the rate, the time rate at which counters, clocks,
if you will, registers that are being used as counters, time
out and actions are based on when those registers time out
and you simply change the rate at which all that's happening.

Q   And pressing the button to change the speed merely
changes that number, which is a variable to the play of the
game or the system?

A   That's correct.

Q   One other thing that came up yesterday with respect
to the ball in play, covered, I think, baseball rather
specifically, but in football, when the football, when the
controlled defensive captain intercepts the pass and has
the ball, when he is finally stopped, isn't it a fact that
the ball appears where he was stopped and that's the new
scrimmage point in the play of the game?

MR. COOK: Objection, your Honor. The form of the question is misleading and mischaracterizes the testimony. There has never been any testimony by this witness that there was any ball when it was caught, contrary to the testimony, the ball disappeared. The question is improper.

MR. ANDERSON: If I can have the question reread, I didn't intend to misstate the question, but I may have misspoken.

THE COURT: Will you read the question, Miss Court Reporter.

(Question read)

MR. ANDERSON: I think the question was proper,
your Honor.

MR. COOK: Your Honor, there is no testimony
that says the defensive player has the ball.

THE COURT: Well, the objection is overruled.
Let's proceed.

MR. ANDERSON: Thank you, your Honor.

BY THE WITNESS:

A   Well, I think I would have to make the same
statement, that I don't think I testified that the receiving
captain has the ball at that point. The ball disappears
and it is not true that scrimmage starts at that point
necessarily for the next game -- for the next play.

BY MR. ANDERSON:

Q   Now, I watched the game; I saw a little white
dot appear after the interception and the man was tackled.
Was that little white dot to represent the ball, Dr.
Chandler?

A   In the particular plays that we had, we may very
well have had a situation which we did not move the receiver
at that point. But certainly if   that man can be run,
it can be run to any other place, and wherever that man
runs is where the play will start for the next play.

Q   You may have misunderstood my question.

Where that -- and I think this is the way it reads, but let's make sure.

I am asking when the defensive captain, the player-controlled captain, intercepts the ball and is later stopped by an opponent, where he is stopped by the opponent, the ball appears for the next down, is that correct?

A   That's correct, yes.

Q   Now, the system, I presume, knows that that's where the ball should be for the next down in order to put it there, isn't that right?

A   Well, I don't know whether saying knows that that's where the ball should be is quite the right language, but certainly the program is one that says when we get ready to initialize the next play, that's the place that we will place the ball into action for the next play.

Q   But the ball for the next play isn't where you say it disappeared, but it is where that player who caught it is stopped?

A   That's correct.

Q   With respect to your testimony yesterday, I would
like to refer you specifically to several parts of the
transcript, starting at Page 917. The first is at the bottom
of 917 where you were asked: "How are the graphics displayed
in this system?"

And perhaps we should have, I think it is
AH-10.

And your answer was: "They are related by
a separate display processor which utilizes information
which has been supplied to it by a separate game play
programmer, processor."

Was the "programmer" just a misstatement?

A   It was a misstatement, yes.

Q   So it should read, "Game," it should read, "Game
play processor?"

A   That's correct.

Q   Now, this block that you have labeled Back Tab RAM
and 16-bit RAM, that's also known as the System RAM?

A   We sometimes call it System RAM and sometimes call
it Control RAM.

Q   Is that a part of the game play processor which
I understand includes at least the CPU; or is that a part
of the display processor which I understand includes the
STIC and perhaps more?

A   It is shared by both. There are portions of it

that are used exclusively by the game play processor. There

are portions of it that are used exclusively by the display

processor. And there is the one section, the back tab section,

which is a communication section between the two. It is a

handshaking section where the CPU puts instructions and the

display processor uses those instructions out of that

common store.

Q   Now, the GROM and the GRAM, would you say that's

a part of the display processor?

A   Yes.

Q   Now, on Page 918 you were asked: "Where do the

patterns for the objects or symbols originate?"

And you answered the question: "They are

provided to the graphics RAM or graphics ROM from the

computer, which is the game play processor."

Now, first, are you saying that the CPU is a

computer in your nomenclature, or something else?

A   CPU is a part of the computer. To be a computer

it takes the rest of the elements that we have over there

in the left-hand side.

And when I say CPU, it is actually the CPU

that is doing the direct communication with another device

like the graphics RAM.

The basis for it doing that communication comes

from the program store and memory and what have you that's

in the rest of the computer function.

Q   So it is not just the microprocessor?

A   It is not just the microprocessor.

Q   That you consider to be a computer?

A   That's correct, yes.

Q   It includes the microprocessor, which we have labeled CPU, and the executive RAM?

A   Executive ROM, yes.

Q   ROM, I'm sorry.   And 8-bit RAM?

A   Yes.

Q   The hand controllers and the game cartridge, such as tennis?

A   Yes.   The hand controllers are gray as to whether you include that as part of the computer or not.   But the ability to communicate with an outside device is important.

Q   Now, you state that: "The patterns of the objects are provided to the graphics RAM or graphics ROM from the computer."

MR. COOK: Can we have a reference to the page of the transcript?

MR. ANDERSON: Same page, 918.
BY MR. ANDERSON:

Q   Now, isn't it a fact that the little pictures and the graphics are permanently stored in the ROM, the graphics ROM? They are never removed from that?

A   That's correct. If I said, if I included graphics ROM in this statement yesterday, it was a misstatement. The graphics ROM cannot be written into, and the computer does not write into the graphics ROM.

Q   With respect to the graphics RAM, the random-access memory for the pictures the descriptions of the pictures of the information, the data that defines the pictures, comes from the game cartridge and is put into the graphics RAM, is that right, at the beginning of play?

A   Yes. There are two processes that are involved. One is to take patterns directly from the game play cartridge and translate them over to the graphics RAM.

Another mode of operation is to take instructions for computing patterns and transferring those, creating those patterns and putting them into the graphics RAM,

in which case those instructions come from the cartridge

But the patterns are not there.

Q   With respect to the hit and hitting symbols

in the six games we are talking about, do you know which

of those two is used or whether they are both used?

A   I have not examined the programs in enough detail

to identify that. I suspect that almost all, if not all,

are direct patterns that have been transferred over.

Ball patterns probably have not. They have probably been

computed.

     But the complex patterns probably have all been

transferred as patterns.

Q   The ball pattern is just a dot, isn't it?

A   Well, it is several dots. It makes up a bigger

than -- it is bigger than a single pixel. But it still

is a pattern and has to be stored in the graphics RAM and

displayed from there as an object.

Q   Then later on down that page, you were asked:

"Q   Are the patterns for the objects

or symbols generated by the display processor?

"A   The patterns are not generated

by the display processor, no."

It is a fact that the patterns are stored in

the GROM and the GRAM, the graphics ROM and the graphics

RAM, is that right?

A   That's correct.

Q   And they are just applied at the right time,

controlled by the display processor, the STIC chip, to generate

the composite video and make up the picture?

A   That's correct.

Q   Now, on the next page, Page 919, you were asked:

"Q   And where does this information come

from?"

You may have to read your last answer, which

relates to the graphics.

"Q   And where does this information come

from?

"A   This is provided to the STIC chip by

the computer, the game play processor,"

now, are you there suggesting that it is just the game play

processor that makes up the computer, or did you mean to

include in that answer the executive ROM and so forth that

you just testified about?

A   Well, to me the game play processor is synonymous with the computer. I don't mean just the microprocessor when I say the game play processor. I mean the entire processor on the left-hand side, which is a digital computer.

Q   So you are not suggesting that the micro -- a microprocessor is a computer?

A   That's correct.

Q   On Page 920, Dr. Chandler, you were asked:

"Q How does a display processor generate the display signals for objects or symbols to be displayed on the screen?

"A For the moving objects, which is what we are primarily concerned about, the information is assembled during the horizontal retrace time for each scan line on a TV, for the eight possible lines of object data for that particular line of TV scan and then during the scan time, during the picture time of that scan the horizontal position for each of the moving objects is compared with the position of the scan across the screen," et cetera.

You can read through it.

Now, isn't it a fact, Dr. Chandler, that first the information is assembled for an entire frame of the TV

1   picture, an entire display, and during the retrace time,

2   in response to SR-1, the Service Request that's synchronized

3   with vertical sync, that picture is, for the whole frame,

4   is loaded into or identifiers for that picture are loaded

5   into the STIC chip?

6   A   I think you have said two or three different things

7   in that statement.

Q   I apologize if I did. My nomenclature may not
always be perfect in this art.

A   I can appreciate that.

MR. COOK: Your Honor, it seems to me -- I have
the same reservation. I am trying not to object.
Perhaps counsel could specifically present which
part --

THE COURT: Dr. Chandler has recognized there are
several parts to the question. He is trying to
answer it.

MR. ANDERSON: Thank you, your Honor.

THE COURT: Let's proceed.

BY THE WITNESS:

A   The testimony that you started out by referring
to has to do with the activity that is involved by the
display processor to create the display from the informa-
tion that has defined what the picture is, and that is
not done total frame at a time. That's done line by line,
as far as the actual creating of the output signal to go
to the TV set. The display processor function is done line
by line. The last part of what you were talking about
had to do with when does the definition of what do we want
displayed for a screen get transferred into the display
processor and, yes, there is -- the necessary statements,
the necessary information as to what do we want this next

frame of picture to be, not bit by bit, but in terms of

a definition is transferred into the display processor,

the various portions of the display processor during the

vertical retrace time by the computer.

Q   And once that transfer by the CPU, the game

processor is accomplished during vertical retrace time,

everything else you described occurs without further

reliance on the game processor, is that correct?

A   That's correct. From that point on, it is just

a display process.

Q   Now, at page 922, Dr. Chandler, you were asked:

"Are any delay circuits or networks used to

determine the position of objects or symbols or

to cause discrete movements of those objects or

symbols?

"Answer: No, in all cases they are computed."

Dr. Chandler, when you were asked that question,

did you understand that a delay circuit meant something that

causes one event to occur sometime after a prior event in

a system, a game system?

A   Well, in the sense in which this was -- this

conversation was taking place had to do with delay circuits

that relate to delays from sync pulses or timing signals

relative to the display of the picture.

If you want to take a very broad interpretation

anything that's talking about time elapse from a game play

standpoint I suppose could be interpreted as delay, and

that was not the sense in which I was answering the

question.

      Certainly, there are time related functions as

far as game play is concerned. When do we want an object

to move to some other place has nothing to do with the detail

timing relationship in the display process. That was the

sense in which I was answering.

Q   But in fact, in the Mattel game, there are
circuits for producing a delay between vertical sync and
the indication of what line the particular moving object,
a hit or hitting symbol, should be displayed, isn't that
correct?

A   There is circuitry which you could describe as
delay circuitry in the process of displaying, of creating
display signals. The distinction I'm making is that those
delays are in no way involved in deciding from a game play
standpoint where we would like to have those objects be
or what those objects should be. That's the distinction.

MR. ANDERSON: Your Honor, I would like to
move to strike the answer.   I think the question
was simple and straightforward. I don't think the
answer was responsive.

MR. COOK: It is perfectly responsive, your
Honor.

THE COURT: Would you read the question and
answer.

MR. COOK: He asked a specific question and
he is entitled to a specific answer.

(Record read)

THE COURT: The motion is denied. Let the
answer stand.

BY   MR. ANDERSON:

Q   Dr. Chandler, was your answer "Yes" or "No" to my question, with the explanation you have given?

A   It would have to be "Yes and no," because your question really implied two different things, and I attempted to answer the two different pieces separately.

THE COURT: Proceed.

1066 to 1101

In Camera

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